

The 2008 Super Tuesday Tornado Outbreak: Synthetic dual Doppler analysis of contrasting tornadic storm types

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During the Super Tuesday Tornado Outbreak on 5-6 February, a significant number of storms passed within about 40 km of WSR-88D radars. This distance, combined with the significant motion vector (from the southwest at 20-25 m s⁻¹) of relatively steady storms, is amenable to a synthetic dual Doppler analysis during the times when the storms passed the WSR-88D locations. Nine storms will be analyzed using the SDD technique. The following table provides their general characteristics and nearest approach to the 88D radars. For this data set, storm structure ranges from isolated supercell to QLCS.

Each storm will be analyzed for a 40-60 min period during passage by the WSR-88D radar to determine general storm properties. Analysis of high-resolution single Doppler data around the time of passage (± 30 min), combined with 1-2 SDD analyses, will be used to examine the kinematic structure of low-level circulations (e.g., mesocyclone, downdraft) and the relation to the parent storm. This analysis may provide insights on the fundamental differences between cyclonic circulations in supercell storms and those within QLCS's.

Radar	Time (UTC)	Type	Az/Range ¹	Coverage	Comments
NQA	2245	supercell	130/10-30	mesocyclone	Organizing supercell
NQA	2345	supercell	130/20-50	Storm-scale	EF-2 tornado during the time of passage
HPX	0100	supercell	310/40	storm	EF-2 tornado near the time of passage
OHX	0345	supercell	130/10	mesocyclone	EF-3 tornado 15 min after
OHX	0700	Supercell	310/30	storm	EF-1 tornado just after
LOU	0450	QLCS	310/20	Storm/meso	Near time of EF-2 tornado
LOU	0540	QLCS/bow	140/20-40	Storm/meso	EF-1 tornado during
OHX	0740	Supercell	310/30	storm	EF-1 tornado during
GWX	0800	supercell	130/10	mesocyclone	EF-1 tornado 30 min after

¹ This is the azimuth and range from the radar near the time of closest approach.